

The pattern emerging for Kpando, in fact looks different from almost all the dialects. Their nasal space seems compressed to the center of the oral space. [ẽ] is significantly high and retracted as compared to [e]. [ɛ̃] is low and rather more front than [ɛ].

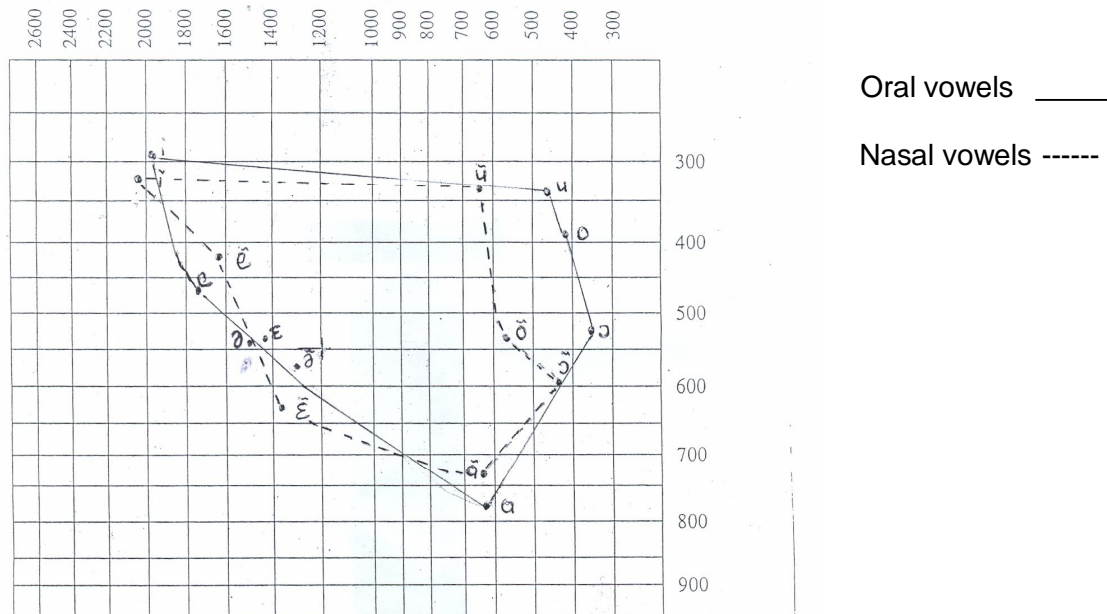


Figure 4.9.4. F1/F2¹ Vowel Space plots for the mean formant values of Oral and Nasalized Vowels by Kpando speakers.

Their back-nasalized vowels do not however appear to be different from those of the other dialects. This means that there is not significant difference in the space of the nasalized back vowels of this dialect as compared to those of the other dialects. They are also less back compared their oral counterparts.

Figure 4.5.3 is formant plot of the mean values of the vowels of Tɔŋu speakers. Their nasal vowels realization differs substantially from the oral ones. Comparing the two spaces, it is clear that the nasal space is characterized by a shift in position of the acoustic space to the front as compared to the oral vowel space. This has rendered the front nasalized vowel more front and the back ones less back just as it has been observed from the preceding dialects. [e] and [ɛ] are closely located with [e] a little higher. The paired t-test however shows a

significant difference between them. It seems therefore that they used [ẽ] in place of [ã]. (See result of the paired sample test reported in table 4.5.1).

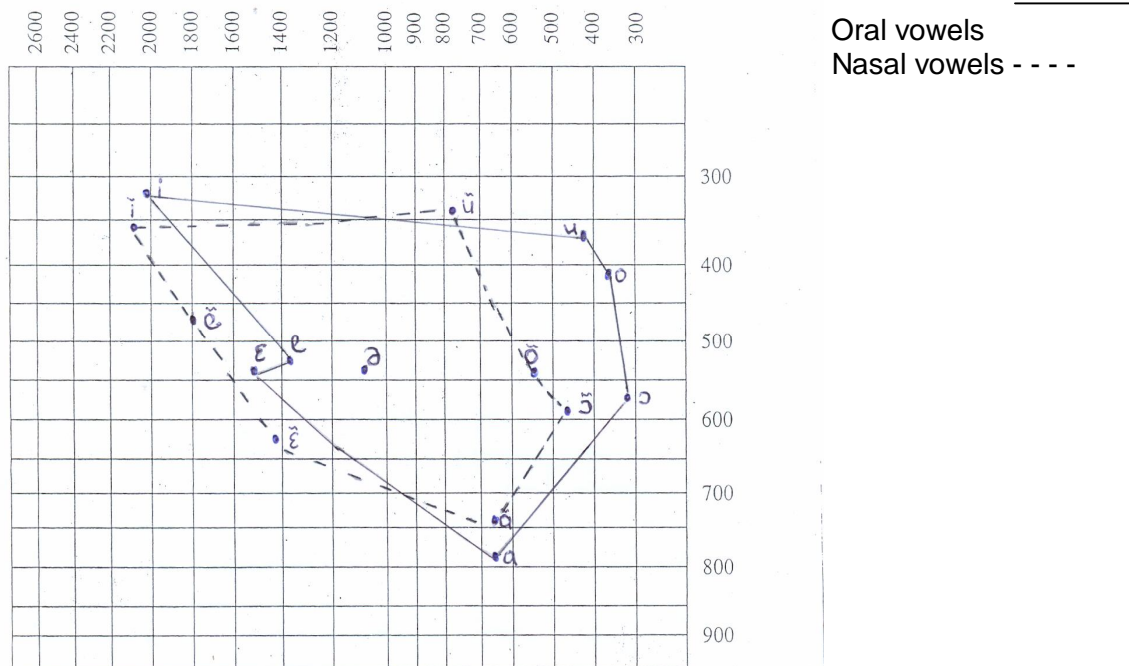


Figure 4.9.5. F1/F2' Vowel Space plots for the mean formant values of Orals and Nasalized Vowels by Tɔŋu speakers.

In general, the space of the back vowels is not affected by dialectal differences but the front spaces cannot be said to be homogeneous. Instead, they appear to be unique as far as the different dialects are concerned. Aŋɔ and Avenor however, look the same and can be grouped as one.

4.10 Gender Differences in Vowel production across Dialects

This section compares vowel sounds across gender within each dialect. For examination with regard to gender, vowels were subjected to ANOVA with gender as the independent variable. For each dialect, the results were obtained for the distinction between male and female formant frequency positions across vowels. The F1 and F2' were examined separately so that the differences inherent in F1 and F2' can be observed. F1 of the back vowels were generally affected by gender differences than F2' while the F2' of the front vowels are also affected. Aŋɔ, Avenor and Tɔŋu have a significant difference ($p < .023$, $p < .009$ and $p < .007$) between male and female speakers for F1 of the vowels [a] respectively. The female speakers of these dialects produced a lower and more open [a] as compared to the male speakers. Aŋɔ male speakers also have more backward [a] than female speakers. Gender is not a factor of [a] production in

Kpando but Ho had gender significantly affecting F2¹ of [a]. Ho female speakers have more centralized [a] as compared to male speakers with a significant difference level of $p < .002$. For the other back vowels, gender affected F1 of [u] for Anlo and Kpando ($p < .009$ and $p < .045$) and [ɔ] for Avenor ($p < .043$). That is Anlo and Kpando female speakers produced a lower [u] while Avenor female speakers produced more open [ɔ] than the male speakers. Except for Tɔŋu, Female speakers of all the dialects realized [i] more front than male speakers. Gender particularly affected [e], [ɛ] and [i] of Ho and Kpando speakers. There were highly significant differences in the F2¹ of these vowels by male and female speakers. The female speakers have them more front as compared to male speakers. Kpando females for instance have 2226 Hz for [i] while the males have 1693 Hz. Figures 4.10.1 to 4.10.6 are the formant plots for the differences in the mean values of the oral vowels by the male and female speakers of the various dialects.